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Concurrent Diagnoses of HIV and AIDS in New Mexico

Introduction

The HIV/AIDS Epidemiology Program in New Mexico conducts confidential name-based HIV/AIDS reporting and subsequent epidemiological analyses. The HIV surveillance case definition includes a positive screening test result (*e.g.*, reactive EIA) confirmed by a positive result from a supplemental HIV antibody test (*e.g.*, Western Blot). HIV infected persons who have progressed to AIDS are identified based on a case definition using either immunological data (specifically, an absolute $CD4^+$ T lymphocyte cell count of <200 or $CD4^+$ <14% of total lymphocytes) and/or a clinical diagnosis of an opportunistic infection (OI).[1,2]

With the advent of highly active antiretroviral therapy (HAART) in 1996 and proper preventive therapy for OIs, the progression of HIV to AIDS can be prevented or delayed considerably, allowing persons infected with HIV to live longer, fuller lives. In this report, we use New Mexico HIV/AIDS surveillance data collected from 1998 to 2008 to make inferences regarding concurrently diagnosed cases, defined as those cases that progress to AIDS less than one year after their initial HIV diagnosis. Concurrently diagnosed cases represent persons who are diagnosed late in the course of infection, *i.e.* 'late testers', and indicate missed opportunities to improve the health outcomes of HIV+ persons.

Concurrent diagnoses in New Mexico

Despite our efforts to expand and increase HIV testing and provide patient education, people continue to be diagnosed late in the course of their infection. Table 1 presents HIV/AIDS data in New Mexico from 1998 to 2008 for various population groups. Among New Mexicans diagnosed with HIV, 43.2% (646/1,497) received a concurrent AIDS diagnosis; this percentage is relatively higher than the U.S. concurrent diagnosis of approximately 38%.[3]

The spectrum of 'late testers' identified in Table 1 is clearly as diverse as the entire population reported with HIV/AIDS. In New Mexico, the proportion of HIV positive Hispanics with concurrent diagnoses (46%) was higher than that of Whites, African Americans, and American Indian/Alaska Natives (the number of Asians and those identifying as multi-race were relatively small for accurate comparison). The higher proportion found among Hispanics is concordant with the CDC's findings through case surveillance in 30 U.S. states as well as through the *Supplement to HIV/AIDS Surveillance* (SHAS) interviews conducted in New Mexico and across the U.S. in 2000-2003.[4]

The proportion of persons concurrently diagnosed increased across age categories. For example, more than half (53.8%) of persons aged 40-49 at the time of HIV diagnosis were concurrently diagnosed with AIDS; this proportion was 63.6% for persons aged 50-59 and 73.1% for persons aged >60 years. A smaller proportion of women received concurrent diagnoses relative to men (34.4% *vs.* 44.6%, respectively). Concurrent diagnoses were highest among residents of the southeast and northeast regions of the state (52.1% and 48.3%, respectively; Figure 1).

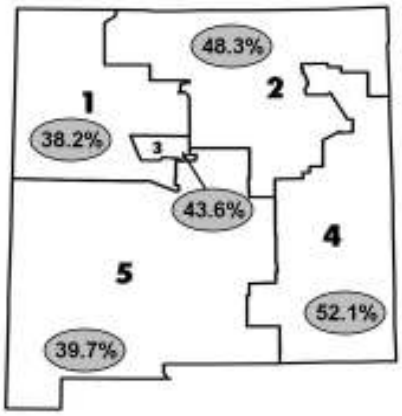

Figure 1. New Mexico DOH Public Health Regions and associated concurrent diagnoses percentages, 1998 - 2008

Figure 2 depicts the annual incidence of concurrent and non-concurrent diagnoses among persons with HIV/AIDS in New Mexico since 1998. This figure illustrates that, though the number of concurrently diagnosed cases has remained relatively constant, progress has been made in reducing the proportion of persons diagnosed with HIV who are concurrently diagnosed with AIDS. Between 1998 and 2004, there were 45.6% concurrent cases among new diagnoses. Between 2005 and 2008, this average declined to 39.5%.

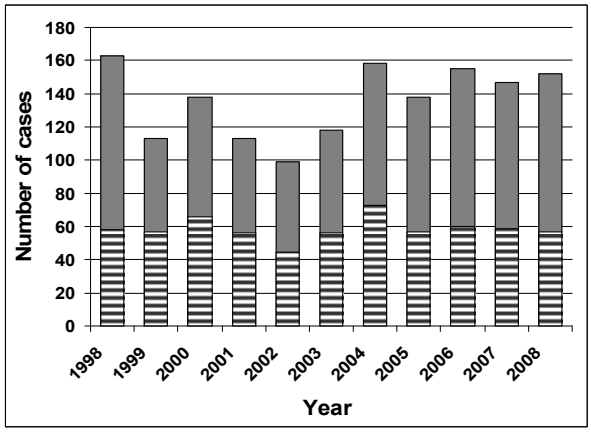

Figure 2. Annual incidence of concurrent and non-concurrent diagnoses among persons with HIV/AIDS in New Mexico. The hatched areas represent concurrent diagnoses, whereas the solid areas represent non-concurrent HIV/AIDS diagnoses.

Concurrent diagnoses and morbidity

Among reported HIV cases that have progressed to AIDS, the AIDS-defining condition among those concurrently diagnosed is more often based on the presence of immunologic results than on clinical features. Figure 3 depicts New Mexico AIDS cases that were concurrently and non-concurrently diagnosed by immunological or clinical AIDS diagnosis. Clearly, most concurrent cases had their AIDS-defining condition identified *via* reported CD4+ levels (filled circles). Also, it is evident that, since 2003, there has been an increased disparity between concurrent and non-concurrent cases (closed circles *vs*. open circles and open squares) as well as between the AIDS-defining condition; these trends could represent a bias toward under-reporting of OI data among those non-concurrently diagnosed coupled with relatively improved reporting of laboratory (immunological) data.

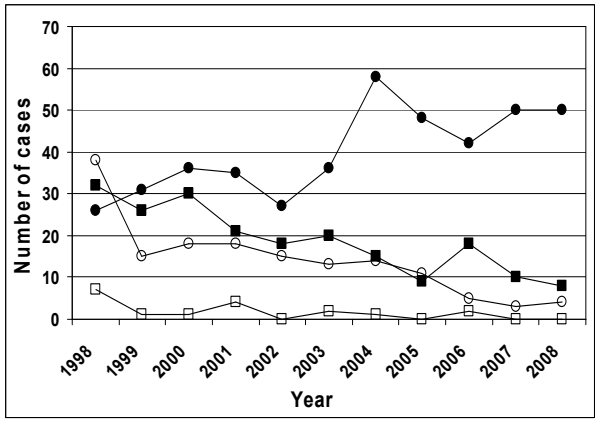

Figure 3. From 1998-2008, concurrently and non-concurrently diagnosed AIDS cases by immunological and clinical criteria. Circles represent immunological (CD4+) AIDS diagnoses, whereas squares represent AIDS cases identified by opportunistic infections. Within each symbol type, the open and closed symbols represent non-concurrent and concurrent diagnoses, respectively.

Among all cases that have developed an OI, those cases concurrently diagnosed developed an OI relatively sooner than those cases non-concurrently diagnosed (Figure 4). Specifically, greater than 90% of concurrent cases developed an OI within 36 months of diagnosis, including at the time of diagnosis. In contrast, less than 25% of non-concurrent cases developed an OI within 36 months.

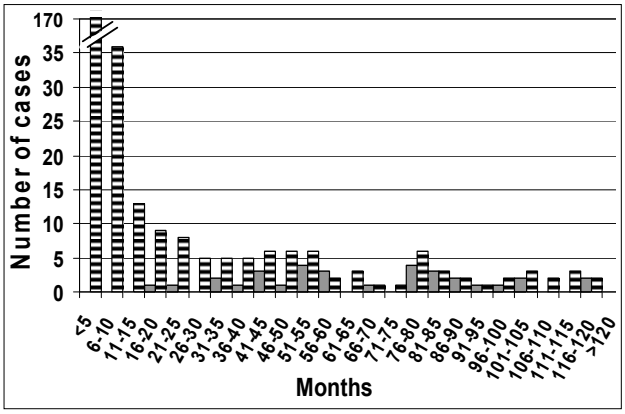

Figure 4. Months from AIDS diagnosis to acquire an OI. The hatched areas represent concurrent diagnoses, whereas the solid areas represent non-concurrent AIDS diagnoses.

In examining morbidity associated with concurrently *vs*. non-concurrently diagnosed cases, it's important to consider which OIs affect persons with HIV. Opportunistic infections are caused by many types of pathogens, including protozoa, bacteria, fungi and viruses.[5] Without effective prophylaxis, infection with HIV compromises the immune system, allowing OIs to develop and cause health problems, potentially causing premature mortality. Of New Mexico AIDS cases that ever developed an OI, 89.7% (269/300) were concurrently diagnosed, whereas only 10.3% (31/300) were not concurrently diagnosed. Table 2 lists the frequency (by concurrent *vs*. non-concurrent status) of the most common OIs.

	Concurrent	Non-concurrent
Opportunistic Infection	**n**	**n**
Kaposi's sarcoma	29	3
Pneumocystosis	111	11
Wasting syndrome	30	1
Toxoplasmosis	5	0
Candidiasis	38	5
Mycobacterium avium	11	3
Mycobacterium tuberculosis	16	1
Cytomegalovirus	26	5
Coccidioidomycosis	7	1
Cryptosporidiosis	5	0
Herpes simplex	7	1
Histoplasmosis	8	0
HIV encephalopathy	7	0
Lymphoma	8	0
Pneumonia	8	0
Other	26	7

Table 2. Counts of common opportunistic infections among New Mexico AIDS cases concurrently and non-concurrently diagnosed, 1998-2008. Some cases had more than one OI.

Public Health Implications

The public health implications of concurrently-diagnosed individuals, or 'late testers', are three-fold. First, persons diagnosed with HIV when they are already symptomatic and/or immunosuppressed may miss opportunities to delay the progression of HIV/AIDS disease by timely initiation of anti-retroviral treatment. Second, given that late diagnosis may be an important contributing factor to morbidity, concurrent diagnoses hinder the administration of prophylaxis for opportunistic infections. Third, because they are unaware of their HIV status, 'late testers' may unknowingly transmit HIV to others.

By identifying New Mexico populations disparately affected by concurrent diagnoses, we may gain further insight into testing behaviors among specific groups. Our New Mexico-specific findings suggest the need for targeted early testing for: 1) males; 2) Hispanics; and 3) at-risk residents of the southeast and northeast regions of the state. Ultimately, these data can be used to refine our HIV testing and prevention strategies to better serve these identified at-risk populations.

References

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TABLE 1. Concurrent Diagnoses, by selected characteristics, NM (1998-2008) *vs.* US† (1998-2005)

	No. with HIV/AIDS diagnosis in NM		NM AIDS diagnosis ≤ 1 year after HIV diagnosis		No. with HIV diagnosis in US		US AIDS diagnosis ≤ 1 year after HIV diagnosis
	N	% of total	N	% within group	N	% of total	% within group
Sex							
Male	1,273	85.0%	569	44.6%	200,882	71.4%	40.2%
Female	224	15.0%	77	34.4%	80,539	28.6%	34.8%
Race / Ethnicity							
White	493	32.9%	206	41.8%	85,149	30.3%	37.1%
Hispanic	758	51.5%	349	46.0%	42,098	15.0%	42.0%
American Indian / Alaskan Native	136	8.9%	52	38.2%	1,463	0.5%	39.0%
African American	90	5.7%	30	33.0%	148,146	52.6%	38.7%
Asian/Pacific Islander	10	0.7%	5	50.0%	1,742	0.6%	44.1%
Multirace	10	0.7%	4	40.0%			
Age at Diagnosis							
< 13	4	0.3%	2	50.0%	2,100	0.7%	19.0%
13-19	44	2.9%	2	4.5%	8,303	3.0%	16.1%
20-29	354	23.6%	72	20.3%	60,089	21.4%	24.7%
30-39	497	33.2%	223	44.9%	99,657	35.4%	38.5%
40-49	392	26.2%	211	53.8%	74,934	26.6%	45.3%
50-59	154	10.3%	98	63.6%	26,989	9.6%	51.3%
60+	52	3.5%	38	73.1%	9,349	3.3%	57.0%
Region at Diagnosis							
1, Northwest	241	16.1%	92	38.2%	N/A	N/A	N/A
2, Northeast	205	13.7%	99	48.3%	N/A	N/A	N/A
3, Bernalillo County	675	45.1%	294	43.6%	N/A	N/A	N/A
4, Southeast	94	6.3%	49	52.1%	N/A	N/A	N/A
5, Southwest	282	18.8%	112	39.7%	N/A	N/A	N/A
Mode of Exposure							
Males - Sex with Males (MSM)	776	51.8%	341	43.9%	100,231	35.6%	40.9%
Injection Drug User (IDU) - Males	105	7.0%	47	44.8%	20,970	7.5%	42.0%
Injection Drug User (IDU) - Females	47	3.1%	18	38.3%	11,184	4.0%	32.9%
MSM/IDU	107	7.1%	46	43.0%	9,494	3.4%	38.2%
Heterosexual - Males	71	4.7%	36	50.7%	21,883	7.8%	43.1%
Heterosexual - Females	111	7.4%	41	36.9%	39,218	13.9%	34.0%
Other or Unknown	280	18.7%	117	41.8%	78,441	27.9%	37.7%
Year of diagnosis							
1998	163	10.9%	58	35.6%	15,429	5.5%	41.6%
1999	113	7.5%	57	50.4%	23,295	8.3%	40.6%
2000	138	9.2%	66	47.8%	28,842	10.2%	39.5%
2001	113	7.5%	56	49.6%	38,818	13.8%	36.4%
2002	99	6.6%	45	45.5%	36,244	12.9%	36.7%
2003	118	7.9%	56	47.5%	33,826	12.0%	37.7%
2004	158	10.6%	73	46.2%	35,645	12.7%	37.6%
2005	138	9.2%	57	41.3%	34,424	12.2%	36.4%
2006	155	10.4%	60	38.7%	**	**	**
2007	147	9.8%	60	40.8%	**	**	**
2008	155	10.4%	58	37.4%	**	**	**